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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHANNAVAJJALA, SRIRAMA T	
ART UNIT	**PAPER NUMBER**
2166	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/824,068	CABRERA ET AL.	
	Examiner	Art Unit	
	Srirama Channavajjala	2166	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/19/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 21-53 are presented for examination.

2. Examiner acknowledges applicant's "preliminary Amendment" filed on 6/17/2004.

3. Claims 1-20 have been cancelled [6/17/2004].

Drawings

4. The Drawings filed on 6/17/2004are acceptable for examination purpose.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. ***Claims 21-53 are rejected under 35 U.S.C. 101 because invention is directed to non-statutory subject matter.***

As set forth in MPEP 2106(II)A:

Identify and understand Any Practical Application Asserted for the Invention

The claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373, 47USPQ2d at 1601-02. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research (Brenner v. Manson, 383 U.S. 519, 528-36, 148

USPQ 689, 693-96); In re Ziegler, 992, F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993)). Accordingly, a complete disclosure should contain some indication of the practical application for the claimed invention, i.e., why the applicant believes the claimed invention is useful.

Apart from the utility requirement of 35 U.S.C. 101, usefulness under the patent eligibility standard requires significant functionality to be present to satisfy the useful result aspect of the practical application requirement. See Arrhythmia, 958 F.2d at 1057, 22 USPQ2d at 1036. Merely claiming nonfunctional descriptive material stored in a computer-readable medium does not make the invention eligible for patenting. For example, a claim directed to a word processing file stored on a disk may satisfy the utility requirement of 35 U.S.C. 101 since the information stored may have some "real world" value. However, the mere fact that the claim may satisfy the utility requirement of 35 U.S.C. 101 does not mean that a useful result is achieved under the practical application requirement. The claimed invention as a whole must produce a "useful, concrete and tangible" result to have a practical application.

6. The invention as claimed in claims 21-53 and interpreted in light of the specification page 5-6,page 15-17page 19-26, is directed to volume providers configuring storage devices particularly related to logical volume configuration epoch which is a combination of hardware and software or a data storage subsystem which is preformed using hardware and software or software per sa, these computer-readable storing medium[s] performing a mathematical algorithm, formula, or calculation, and as

such the claimed invention is subject to the test of State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. Specifically State Street sets forth that the claimed invention must produce a ***"useful, concrete and tangible result."*** The **Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility** states in section IV C. 2 b. (2) (on page 21 in the PDF format):

> The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a § 101 judicial exception, in that the process claim must set forth a practical application of that § 101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had "no substantial practical application.").

7. Claims 21-53 have the result of producing "*determining a configuration status based on a comparison of the epoch indenter from each extent of the logical volume" [see claim 1]; "epoch identifier for determining a configuration status of the first logical volume based on a comparison of the epoch identifier from each first extent associated with the first logical volume", "determining a configuration status of the copy of the first logical volume based on a comparison of the copy epoch identifier from each second extent associated with the copy of the logical volume" [see claim 30],"determining a configuration status based on the comparison of the epoch value from each extent of the logical volume and the copy epoch value from each extent of a mirrored copy of the logical volume, and the selected consistency level" [see claim 38,claim 46]* , however the claims 21,30,38,46, ***do not specify the result*** or output the results to a user or

otherwise used in the real world. Furthermore, there is no use of this *determining a configuration status based on a comparison of the epoch indenter from each extent of the logical volume* [for example claim 21] is set forth that would constitute a real-world result. Thus the claimed result is not a *"useful, concrete and tangible result*." The court in State Street noted that the claimed invention in Alappat constituted a practical application of an abstract idea because it produced *a useful, concrete and tangible result* the display of a smoothed heart beat to a system user. The Federal Circuit further ruled that it is of little relevance whether a claim is directed to a machine or process for the purpose of a § 101 analysis. AT&T, 172 F.3d at 1358, 50 USPQ2d at 1451 (see the Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, Annex II).

The examiner reviewed the specification but was unable to find a practical real-world use of the result (*determining a configuration status based on a comparison of the epoch indenter from each extent of the logical volume, for example claim 21*). If the applicant is able to find one and inserts it into the claims provide the location the element is found in the specification.

In the analysis above, claims 22-29, 31-37, 39-45, 47-53 depends from claims 21,30,38,46 are also rejected under 35 USC 101.

For "General Analysis for Determining Patent-Eligible Subject Matter", see 101 Interim Guidelines as indicated below:

<<http://www.uspto.gov/web/offices/pac/dapp/ogsheet.html>>

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 21-53 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9, of US Patent No. ***6,553,387*** claims 1-16 of US Patent No. ***6,735,603***, although the conflicting claims are not identical, they are not patentably distinct from each other because:

in the present instant application Independent Claim 1 directed to "a computer-readable medium storing at least one extent.....an epoch identifier associated with each at least one extent, the epoch identifier for ***determining a configuration status based on a comparison of the epoch identifier from each extent of the logical volume***" , while US Patent No. ***6,553,387, claim 1,*** limitation "a computerized system.....wherein the *logical manager determines whether to expose the logical volume as on-line to the requester based on a comparison of volume epoch numbers maintained by the logical volume manager;* **claim 7**, limitation, "A computer-readable medium having.....*determining if the volume is to be exposed to the requester as on line based on the comparison of the epoch identifiers*" , further US Patent No. ***6,735,603,*** **claim 1,** limitation "A computerized method for .....modifying the volume epoch identifier on the data structure on each on-line extent of the *logical volume upon a change to a configuration of the logical volume*; **claim 8**, limitation, "A computer-readable medium having.....*comparing the epoch value from each extent of the logical volume; and determining a configuration status based on the comparison of the epoch value from each extent of the logical volume;* **claim 12,** limitation "A method for determining the status of a logical volume having associated therewith a plurality of extents, ...*comparing the values of the examined epoch identifiers; and determining a configuration status of the logical volume based on the comparisiion of the values of the examined epoch identifiers*" .

It would have been obvious one of the ordinary skill in the art at the time of the applicant's invention was made to modify the cited steps as indicated claims

21,30,38,46 in the instant US Application since the omission and addition of the cited limitations would have not changed the process or scope according to which the scope of determining a configuration status, comparison of epoch identifier from each extent of the logical volume. Therefore, the ordinary skilled artisan would have been motivated to modify claims 21,30,38,46 of the cited instant US application by substituting the steps of US Patent 6,553,387, claim 1,7 and US Patent No. 6,735,603 claims 1,8,12, further, the above cited omitting elements would not interfere with the functionality of the steps previously claimed and would perform the same function, it is noted that present application claim is very broad and within the scope of the Claims of the US Patent No. 6,553,387 , 6,735,603 . In re Karlson, 136 USPQ 184 (CCPA 1963).

The dependent claims 22-29, 31-37, 39-45, 47-53 of the instant application are rejected in the analysis above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 21-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mann et al. [hereafter Mann] US Patent No. 5996089 published on Nov 30,1999 in view of Edward K Lee et al. [hereafter Edward], "Petal: distributed virtual disks", proceedings of the seventh international conference on Architectural support for programming languages and operating systems, published on 1996, pp 84-92.

11. As to claim 21, Mann teaches a system which including 'a computer-readable medium storing at least one extent of a logical volume having a plurality of extents' [col 7, line 9-14], Mann directed to distributed computer system having multiple processor system, each processor is interconnected as detailed in fig 1, further Mann also teaches particularly cluster volume related to collection of logical disk blocks as detailed in col 7, line 9-14]; 'determining a configuration status based on a comparison, extent of the logical volume' [col 7, line 15-29], Mann specifically teaches cluster volume structure related to file system that allows to access to data objects [col 7, line 21-23], further Mann also teaches status of the data objects for example read, write, delete files from its local file system [col 7, line 26-28]. It is however, noted that Mann does not

specifically teach "epoch identifier". On the other hand, Edward disclosed 'epoch number"[page 86, col 2, 2.2, line 11-13] corresponds to epoch identifier in relation with virtual disk identifier.

It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Edward into loosely coupled mass storage computer cluster" of Mann et al. because both Mann and Edward are directed to storage system, more specifically, Mann is directed to RAID storage system allocating files for each data input and enabling all processor system to write input data to each of its associated and allocated files in a distributed computer system [col 3, line 5-13], while Edward is directed to managing large storage system and balancing to reduce fragmentation and eliminating hot spots usually requires moving, partitioning, or replicating files and directories in a file system as detailed in fig 1, page 84, col 1, introduction].

One of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Edward into loosely coupled mass storage computer cluster" of Mann et al. because that would have allowed users of Mann to implement data structure into global and local physical maps allows to keep the information available locally, providing to clients to automate the backup and recovery of all data stored on the system particularly tracking the global map identifier and related epoch number []age 86, col 2, line 9-17] bringing the advantages of any new data written to the

original virtual disk will create new entries in the new epoch as suggested by Edward [page 86, col 2, line 22-24], thus improving the quality and reliability of the system.

12. As to claim 22, Mann disclosed 'a cluster system identifier' [fig 6, item 4, col 9, line 67, col 10, line 1-3].

13. As to claim 23, Mann disclosed 'a logical volume identifier' [col 9, line 50-53].

14. As to claim 24, Mann disclosed 'a cluster system identifier and a logical volume identifier' [col 9, line 50-53, line 67, col 10, line 1-3].

15. As to claim 25, Mann disclosed 'computer-readable medium has stored thereon all of the plurality of extents for the logical volume' [col 9, line 57-67].

16. As to claim 26, Mann disclosed 'a number that is incremented upon each change in volume configuration' [col 10, line 17-20].

17. As to claim 27, Mann disclosed 'a timestamp indicating a time a volume configuration was changed' [fig 6D].

18. As to claim 28, Mann disclosed 'an extent size, an extent identifier [fig 6D], Mann specifically disclosed data object stripe size and specific data object name in the data structure as detailed in fig 6D.

19. As to claim 29, Mann disclosed 'a processor that accesses data stored in the logical volume based on the configuration status of the logical volume determined from the comparison [col 2, line 56-63] from each extent of the logical volume [col 7, line 9-12]. On the other hand, Edward disclosed "epoch identifier" "[page 86, col 2, 2.2, line 11-13] corresponds to epoch identifier in relation with virtual disk identifier.

20. As to claim 30, Mann teaches a system which including 'a first computer readable medium storing one or more first extents associated with a first logical volume' [col 5, line 67, col 6, line 4-5, line 59-65], Mann specifically teaches number of processor system connected to the storage unit as detailed fig 1, col 5, line 67, col 6, line 4-5, further Mann also teaches each storage unit associated with extents and logical volume as detailed in col 5, line 59-65];'wherein each first extent includes a first data structure storing' [col 5, line 52-53]; 'determining a configuration status of the first logical volume based on a comparison' [col 7, line 15-29], Mann specifically teaches cluster volume structure related to file system that allows to access to data objects [col 7, line 21-23], further Mann also teaches status of the data objects for example read, write, delete files from its local file system [col 7, line 26-28];

'a second computer-readable medium storing one or more second extents associated with a copy of the first logical volume, wherein each second extent includes a second data structure storing' [col 7, line 50-52, col 8, line 3-9, line 60-62], Mann specifically teaches multiple processors having multiple data blocks processing data fragments containing the data object establishing the fragment files associated with logical volume and extents as detailed in col 8, line 3-9, line 60-62;'determining a configuration status of the copy of the first logical volume based on a comparison of the copy' [col 9, line 46-56], each second extent associated with the copy of the logical volume' [col 10, line 4-14], Mann specifically teaches fragment file data structure having cluster associated with copy logical volume of block as detailed in col 10, line 4-14. It is however, noted that Mann does not specifically teach "epoch identifier". On the other hand, Edward disclosed 'epoch number"[page 86, col 2, 2.2, line 11-13] corresponds to epoch identifier in relation with virtual disk identifier.

It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Edward into loosely coupled mass storage computer cluster" of Mann et al. because both Mann and Edward are directed to storage system, more specifically, Mann is directed to RAID storage system allocating files for each data input and enabling all processor system to write input data to each of its associated and allocated files in a distributed computer system [col 3, line 5-13], while Edward is directed to managing large storage system and balancing to reduce fragmentation and eliminating hot spots usually requires moving,

partitioning, or replicating files and directories in a file system as detailed in fig 1, page 84, col 1, introduction].

One of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Edward into loosely coupled mass storage computer cluster" of Mann et al. because that would have allowed users of Mann to implement data structure into global and local physical maps allows to keep the information available locally, providing to clients to automate the backup and recovery of all data stored on the system particularly tracking the global map identifier and related epoch number []age 86, col 2, line 9-17] bringing the advantages of any new data written to the original virtual disk will create new entries in the new epoch as suggested by Edward [page 86, col 2, line 22-24], thus improving the quality and reliability of the system.

21. As to claim 31, Mann disclosed 'a cluster service component including a third data structure storing a volume' [col 10, line 25-27]. On the other hand, Edward disclosed epoch number"[page 86, col 2, 2.2, line 11-13] corresponds to epoch identifier in relation with virtual disk identifier.

22. As to claim 32, Edward disclosed 'each of the epoch identifiers and the copy epoch identifiers have the same value' [page 86, col 2, line 21-26].

23. As to claim 33-34, Mann disclosed 'cluster service component may be set by a user to expose the first logical volume as on line, each first extent of the first logical volume are the same as the volume identifier' [col 10, line 49-62]. On the other hand, Edward disclosed 'epoch identifier' [page 86, col 2, 2.2, line 11-13] corresponds to epoch identifier in relation with virtual disk identifier.

24. As to claim 35, Mann disclosed 'each first data structure includes a cluster system identifier' [[fig 6, item 4, col 9, line 67, col 10, line 1-3]; 'each second data structure includes the cluster system identifier' [col 10, line 1-8].

25. As to claim 36, Mann disclosed 'each first data structure includes a first logical volume identifier' [col 9, line 50-53]; each second data structure includes a second logical volume identifier' [col 9, line 50-59].

26. As to claim 37, Mann disclosed 'first and second logical volume identifiers are the same ' [col 9, line 42-45].

Claim Rejections - 35 USC § 102

27. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

28. Claims 38-53 rejected under 35 U.S.C. 102(a) as being anticipated by Erlichson et al. [hereafter Erlichson], US Patent No. 5875468.

29. As to claim 38, 46, Erlichson teaches a system which including 'reading an epoch value from each extent of the logical volume' [col 3, line 55-57, col 7, line 41-48], Erlichson is directed to computer system having multiple nodes that has number of processors sharing single cache, as noted from the background that a cache line is either in the readable state writable state or invalided state, particularly, in the readable state, the cache line can be read by a processor [see col 1, line 61-64], further it is noted that logical volume is integral part of Erlichson's teachings because Erlichson specifically directed to hierarchy of storage devices containing cache memory, disk and like [col 1, line 13-22];

'reading a copy epoch value from each extent of a mirrored copy of the logical volume' [col 6, line 30-40];

'comparing the epoch value from each extent of the logical volume and the copy epoch value from each extent of a mirrored copy of the logical volume'[col 7, line 38-48];

'receiving a user selection indicating a selected consistency level' [col 3, line 6-10];

'determining a configuration status based on the comparison of the epoch value from each extent of the logical volume and the copy epoch value from each extent of a mirrored copy of the logical volume and the selected consistency level [col 6, line 30-40, col 7, line 7-14].

30. As to claim 39-40,47-48,43-44,51-52, Erlichson disclosed 'determining a configuration status that exposes the logical volume [col 6, line 5-10] as on line only when the epoch values and the copy epoch values are equal if the selected consistency level is a first consistency level' [col 8, line 7-17, fig 8].

31. As to claim 41,49, 45,53, Erlichson disclosed 'determining a configuration status that exposes the logical volume as on line when the epoch value of each extent of the logical volume are equal if the selected consistency level is a second consistency level' [col 6, line 30-40, col 7, line 7-14].

32. As to claim 42,50, Erlichson disclosed 'maintaining a volume epoch value' [col 6, line 12-15];

'comparing the epoch value from each extent of the logical volume, the copy epoch value from each extent of a mirrored copy of the logical volume and the volume epoch value'[col 6, line 62-65, col 7, line 38-48,]

'determining a configuration status based on the comparison of the epoch value from each extent of the logical volume, the copy epoch value from each extent of a mirrored copy of the logical volume and the volume epoch value, and the selected consistency level' [[col 6, line 30-40, col 7, line 7-14].

Conclusion

The prior art made of record

a. US Patent.No. 5996089

b. US Patent No.. 5875468

c. Edward K Lee et al. "Petal: distributed virtual disks", proceedings of the seventh international conference on Architectural support for programming languages and operating systems, published on 1996, pp 84-92.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Srirama Channavajjala whose telephone number is 571-272-4108. The examiner can normally be reached on Monday-Friday from 8:00 AM to 5:30 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alam, Hosain, T, can be reached on (571) 272-3978. The fax phone numbers for the organization where the application or proceeding is assigned is 571-273-8300 Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free)

sc
Patent Examiner.
April 17, 2006

SRIRAMA CHANNAVAJJALA
PRIMARY EXAMINER